## PP-571 [Pollination and Bee Flora]
## Pollination of red clover (Trifolium pratense) using colonies of the South American bumblebee Bombus pauloensis

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The Apoidea (Hymenoptera) are key pollinators, particularly the bumblebees of the genus Bombus, which are distinguished by their morphology and behavior. Unlike honeybees (Apis mellifera), bumblebees possess long proboscises that optimize nectar access in flowers with deep corollas, such as Trifolium pratense (red clover). In Uruguay, Bombus pauloensis, a native species, has been successfully bred and identified as a long-tongued pollinator, positioning it as a potential pollinator for this legume, whose seed production is limited by pollination deficits. This study aims to assess the pollination capacity of B. pauloensis colonies in a red clover crop. Sixteen colonies were installed in a seedbed, while two apiaries of A. mellifera were positioned 400 meters away. Twelve observation plots were established at three distances from the nests (10, 80, and 160 meters) to monitor pollination activity and seed yield. A higher presence of bumblebees was observed in plots closer to the nests, with a decline in bumblebee numbers as the distance from the nests increased. Palynological analysis revealed that T. pratense was the most utilized resource, both as a pollen source (32-52%) and nectar source (19-52%), with peak utilization occurring during the period of maximum flowering ($P < 0.05$). Seed yield was highest near the nests (709 kg/ha at 10 m), decreasing with distance (423 and 328 kg/ha at 80 and 160 m, respectively). The number of seeds per inflorescence followed the same trend (43%, 30%, and 26%; $P = 0.0037$). A positive correlation was found between the number of bumblebees and seed yield ($r = 0.58$, $P = 0.04$), as well as between the number of bumblebees and the number of seeds per inflorescence ($r = 0.73$, $P = 0.007$). A linear model indicated that seed yield increased with the presence of bumblebees, following the equation: $y = 362.58 + 394.36x$ ($P = 0.01$). In contrast, A. mellifera showed no significant association with seed yield ($P = 0.12$). This study confirms that captive-bred bumblebees significantly enhance seed production in T. pratense, proving to be more efficient than A. mellifera.